

MODIFIED MULTI-LEVEL TABLE GAME APPARATUS AND METHOD

RELATED APPLICATIONS

- 5 This application claims priority from US provisional application 60/ 583, 194 by the same inventors, filed June 25, 2004 and which is incorporated by reference in its entirety.

BACKGROUND

- 10 This invention relates to a modified multi-level table game apparatus and method, useful in, for example the playing of table games such as pool. Such an apparatus and method is disclosed in several forms in US patent 6,712,710. The apparatus illustrated in US patent 6,712,710 is a multi-level game for pool having two or more generally horizontal, game piece supporting playing surfaces or levels supported in stack
- 15 relation, spaced sufficiently apart from one another to allow player access to lower surfaces to impart movement to the game piece along said surfaces. Each surface may have one or more piece receiving pockets. Conduits extend between pockets at adjacent surfaces to provide pathways between such adjacent surfaces. In one form of the apparatus that has three or more playing surfaces, the conduits associated with a
- 20 pocket at an intermediate playing surface provides both upward and downward pathways from that intermediate surface. Those conduits include guides that interact with a piece entering the pocket aligned with those conduits to direct the piece either to a higher surface or a lower surface, dependent upon, among other factors, the speed of the piece. The device disclosed in US patent 6,712,710 provided flippers or so-
- 25 called "shooters": movable parts operable to assist the pool ball in going up to and down from one playing level to another. Such flippers were positioned within conduits connecting the playing surfaces. What is desirable is such a game table preserving the multi level playing action yet eliminating the need for moving parts.

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SUMMARY

In general terms, the apparatus illustrated herein is an improved multi-level game for pool, or similar games, having two or more generally horizontal, game piece
5 supporting playing surfaces or levels supported in stack relation, spaced sufficiently apart from one another to allow player access to lower surfaces to impart movement to the game piece along said surfaces. Each surface may have one or more piece receiving pockets. Conduits extend between pockets at adjacent surfaces to provide pathways between such adjacent surfaces. In one form of the apparatus that has three
10 or more playing surfaces, the conduits associated with a pocket at an intermediate playing surface provides both upward and downward pathways from that intermediate surface. Those conduits include guides that interact with a piece entering the pocket aligned with those conduits to direct the piece either to a higher surface or a lower surface, dependent among other factors, upon the speed of the piece.

15 The apparatus and method illustrated below include a number of changes or modifications from the apparatus and method disclosed in U.S. Patent 6, 712, 710. First, the shape of the conduit is one of a range of curvilinear shapes, and most especially generally spiral. The conduit back wall is shaped first in a tightly curved
20 lower section and then in a shallowly curved upper section, both to conserve space and provide better upward acceleration for a game piece without the use of moving parts. Moreover, a transition ramp included in the curvilinear conduit shape further obviates the need for any moving parts to enable level transition. Using the modified conduits as provided herein, game piece-accelerating flippers or shooters are no
25 longer required at the intermediate levels.

The configuration, size and shape of the conduits have also been modified to enhance performance. The back wall of each such conduit has been widened to maximize the allowable shooting angle of the game piece. The side portions of the conduit back
30 wall are angled at about 15° in each direction so that game pieces angling to the side 15 degrees or less will strike the back wall directly and be more likely to proceed upwardly to the next higher level. Said another way, the back of the conduit is

configured such the at 15 degree hit off center can assume a tangent on impact with the conduit back wall

On the game playing surface, accelerator plates are provided at the pockets on the surfaces surrounding the pockets. The accelerator plates are made of a smooth low-friction material such as plastic, metal or the like. Each plate is slightly angled -within a range of about +3 to -3 degrees— toward the associated pocket. In the preferred embodiment for the game of pool, a positive angle of about 1 degree is used when the players seek a moderately challenging game. Negative angles changes the play as the game piece tends to change levels more easily. A positive angle of about 1 degree add inhibition to motion thereby preventing the ball or other playing piece from spontaneously entering into the pocket based on extraneous movement (jarring the table as a whole, for example). Moreover, the said 1 degree angle provides a slight ramp which has the effect of aiding in upward level change. Each accelerator plate aprons the pocket opening mouth. Further, the accelerator plate may have a slightly conically shape, such shape tending to direct a game piece into the center region of the associated pocket. The angle of the accelerator plate and the slight conical shape together with accelerator plate's smooth surface (relative to the higher friction surface of the remainder of the playing surface which may covered with felt or a like material) combine to direct the game piece and cause an acceleration of a game piece when the piece reaches the accelerator plate moving toward the associated pocket. This increase in acceleration improves the ability of the game piece to travel upwardly rather than downwardly when entering a pocket at an intermediate surface at a higher velocity. In the case where the player strikes the game piece more softly, the game piece will travel down the conduit. The overall effect is creating a game apparatus where skill of the player may be refined and developed.

Further improvements include the provision of overhangs of the conduits at the pockets; such conduit upper region extending toward the adjacent playing surface so as to better control the game pieces and prevent them from flying up and off of the table. The conduit overhang on levels other than a top or bottom level also includes an additional piece guide extending downward from the overhang toward the playing surface, operable to guide the playing piece.

Also improved is the region immediately adjacent to the pocket, by means of the addition of a "director" region: the director region is provided by an extended plastic (or the like) part at the pocket rim . The director region extends from the playing surface at approximately 45 degrees, has a width of approximately $\frac{3}{4}$ of an inch and angles downward toward the opening of the hole. The director region aids in directing the bounce of playing pieces as such pieces descend from the game piece director in the conduit wall, and specifically reduces the likelihood a playing piece will drop from highest to lowest playing level of a multilevel game without exiting on an intermediate level. By means of the director region, the corner of the table where the hole is located is lowered approximately .1" lower than the raised bump on the game piece director. In the event the playing piece descends into pocket region without contacting the bump on the game piece director, the lowered about 45 degree director region aids in causing the game piece to bounce back up onto the nearest playing surface rather than hitting an un-chamfered playing surface edge and deflect in such a way as to continue dropping to a lower level.

Improvements to the playing surface include an invertible design - the playing surface itself may be inverted, making the top the bottom, and making the bottom the playing surface. In the preferred embodiment, the bottom surface includes a honey comb design, that affords structural integrity to the playing surface in addition to providing a surface upon which game pieces may be placed. In another embodiment, the playing surface may be modified by means an insert-able sheet of a low friction material fitting flush with and covering some or all of the playing surface. Such insert-able sheet changes the surface characteristics, permitting games such as hockey, as well as the use of game pieces having shapes other than substantially spherical.

Further improvements include use of a stick or other means to impart motion to game piece where the length of such stick is more than 30 (thirty) inches.

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Also provided is the tool-free assembly and dis-assembly of the game table. Molded, mate-able alignment pins and receiving regions along with snap connectors permit snap assemblage under guiding pressure from human hands.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a schematic prospective view of a three level table game apparatus
5 illustrating a presently preferred embodiment of the invention.

Figure 2 is a schematic side sectional new of the apparatus of Figure 1, illustrating
movement of balls from upper levels to lower levels.

10 Figure 3 is a schematic side sectional new of the apparatus of Figure 1, illustrating
movement of balls from lower levels to upper-levels.

Figure 4 is an enlarged schematic partial side sectional view illustrating balls moving
from a top-level to a lower level
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Figure 5 is in an enlarged schematic partial side sectional view illustrating balls
arriving from a higher level onto a lower level.

Figure 6 is an enlarged schematic partial side sectional view illustrating balls traveling
20 from an intermediate level toward a lower level.

Figure 7 is an enlarged schematic partial sided sectional view of balls arriving from a
higher level to a lower level.

25 Figure 8 is an enlarged schematic partial side sectional view illustrating balls leaving
a lowermost level and moving downwardly to a reservoir.

Figure 9 is an enlarged schematic partial side sectional view illustrating balls leaving
a lower section and traveling toward an upper section
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Figure 10 is an enlarged schematic partial side sectional view illustrating balls moving
upwardly from a lower level to an intermediate level.

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Figure 11 is an enlarged schematic partial side sectional view illustrating balls leaving an intermediate level and traveling upwardly to a higher level.

5 Figure 12 is an enlarged schematic partial side sectional view of balls moving upwardly on to a higher level.

Figure 13 is schematic side sectional view illustrating the pockets and conduits connecting a lower, an intermediate, and an upper level.

10 Figure 14 is a schematic partial top plan view illustrating a pocket and associated conduits with a widened receiving angle.

Figure 15 is a schematic transverse sectional view of the structure illustrated in Figure 13.

15 Figure 16 is a schematic perspective exploded view of the pocket and conduits for accommodating lower, intermediate and upper level surfaces.

20 Figure 17 is a schematic prospective view similar to Figure 1, having two rather than three playing levels.

Figure 18 is a schematic plan view of a cue, a cue ball and a set of player balls.

25 Figure 19 is a schematic perspective view similar to Fig.1, but having four playing levels.

Figure 20 is a schematic perspective view of a playing surface having an accelerator plate at each corner pocket.

30 Figure 21 is a perspective plan view of one of the accelerator plates.

Figure 22 is a side view of one of the accelerator plates.

Figure 23 is a schematic perspective view of a modified apparatus wherein the playing surfaces may be inverted to provide a plurality of surfaces for the play of an additional type of game.

5 Figures 24, 25 and 26 are perspective views of ball guides.

Figure 27 is a schematic cross-sectional perspective view of a portion of the apparatus at a pocket.

10 Figure 28 illustrates an unassembled condition of the preferred embodiment.

Figure 29 depicts a removable plate, herein denominated as a game piece director, in the inner conduit surface.

15 Figure 30 depicts tool-free joining features of the table and conduits.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Figures 1 through 16, 18, 20 through 22, and 24 through 28 illustrate a presently
20 preferred three level embodiment of the invention. The table game depicted is pool, although other games involving movable game playing pieces are intended to be included in the scope of the invention. Table hockey is an alternate embodiment, requiring a surface- friction- lowering insert of smooth plastic or cardboard/chip board cut to fit the playing surface. The current preferred embodiment includes one or
25 more reversible playing surfaces, depicted in Fig 23 and 28.

In the case when the table game played is pool, and the game piece (also referred to herein as "playing piece" or "game playing piece") correspondingly is generally spherical (referred to herein as a "ball") the players may utilize means such as a cue
30 stick and a cue ball to strike the playing balls so as to cause the playing balls to enter the pockets (game piece receiving regions) at the corners of the playing surfaces. The aligned pockets at each corner are connected to one another by the generally upright conduits 136. The conduits 136 between the pockets at the uppermost level and the

intermediate level allow balls to travel downwardly from the upper level to the intermediate level and upwardly from the intermediate level to the uppermost level. The conduits between the pockets at the intermediate level and lower level allow balls to travel in either direction to between the lower level and the intermediate level. It will be noted that the pockets at the intermediate level connect both to the conduits extending upwardly to the uppermost level and to the conduits extending downwardly to the lowermost level. A ball or other game piece entering such a pocket from the intermediate level can be made to selectively travel either upwardly or downwardly by virtue of the speed imparted to that ball. If a ball moves sufficiently slowly, it will go downwardly to the lowermost level. If a ball has sufficient speed, it will travel upwardly to the uppermost level. The same is true of the lowermost level where a high-speed ball can be made to travel upwardly while a low-speed ball will travel downwardly from a pocket to a reservoir or collector.

Figure 2 illustrates travel of the balls downwardly, while Figure 3 illustrates travel of the balls upward. Figures 4 through 12 are enlarged views showing more particularly travel of the balls at various approaches to and from the pockets.

Figures 20 through 22 illustrate in particular the accelerator plates 140 provided in front of each of the corner pockets of a surface 34. As noted above, the accelerator plates have a smooth low-friction upper surface; when a ball leaves the main portion of the play surface 34, which is covered with a higher friction material such as felt, and arrives at the low friction accelerator plate, the ball will tend to accelerate toward the pocket. Further, each accelerator plates is angled slightly upwardly toward its associated pocket, which further tends to further control the movement of a ball, preventing unintended rolling toward that pocket, and aiding in "ramping up" so as to aid in movement to an upper playing surface. The accelerator plate may also be slightly conical or channel shape which tends to direct a slow moving ball toward the center of the pocket.

As seen in Fig 27, and also in Fig 20, a director region 150 is adjacent to the pocket rim or mouth on one side and the accelerator plate on the other. The director region 150 features an extended plastic (or the like) part at the pocket rim. The director

region extends from the playing surface at approximately 45 degrees, has a width of approximately $\frac{3}{4}$ of an inch and angles downward toward the opening of the hole. The director region aids in directing the bounce of playing pieces 110 as such pieces descend from the games piece director 148 in the conduit wall, and specifically

5 reduces the likelihood a playing piece will drop from highest to lowest playing level of a multilevel game without exiting on a intermediate level. By means of the director region 150, the corner of the table where the pocket hole is located is lowered approximately .1" lower than the transition ramp 152. In the event the playing piece descends into a pocket region without contacting the transition ramp 152, the

10 approximately 45 degree lowered director region 150 aids in causing the game piece 110 to bounce back up onto the nearest playing surface rather than hitting an un-chamfered playing surface edge and deflect in such a way as to continue dropping to a lower level.

15 Figures 13 and 16 best illustrate the shape of the conduits 136 as viewed from the side; the lower portion 132 of each conduit is generally curvilinear, then curved about a relatively small radius to create a relatively sharply curved portion, then the upper portion 134 curved about a much larger radius to create a relatively shallow curve portion leading up to the next higher playing level. This configuration of the conduit

20 contributes to the upward movement of a rapidly propelled ball from a lower surface to the adjacent higher surface. In the preferred embodiment, conduit geometry is substantially spiral, although other modified spirals or curvilinear shapes may be used. Further, the inclusion of a transition ramp 152 within the curvilinear or spiral conduit shape obviates the need for moving parts to accomplish controllable transition

25 of a game piece between playing levels.

As also illustrated best in Figures 13 and 16, lip or retainer portion or overhang 146 is provided to overhang in front of the entrance to each of the pockets. The length of the overhang 146 ranges from about 0.5 to 2 inches. In particular, when a ball is rapidly

30 propelled upwardly and out of a pocket onto a playing surface, the overhang is positioned to prevent excessive upward travel of the ball which might cause it to leave the playing surface. This is illustrated in particular by Figures 10 and 12. In the preferred embodiment, the mid level overhand underside features one or more ribs

145 (see Fig 10) such ribs creating a pattern of raised projections (height of about 0.08 of an inch) that provides ball guidance and control.

Figure 14 illustrates in particular the shape of the conduit as viewed from the top (a top cross section view across A-A as in Fig 15) . The side walls extend outwardly at a slight angle from the pocket opening toward the rear wall of the associated conduit. The rear wall of the conduit is wider than the opening of the pocket. The side walls diverge at an angle of about 15° in the preferred embodiment, although angles may be increased up to about 30 degrees, depending on the play action desired. The preferred embodiment allows balls that pass through the pocket opening at an angle to one side or the other of about 15° or less, avoid contact with the side walls while making direct initial contact with the rear wall. This provides for the maximum conservation of energy required for the ball to reach the next upper level.

Fig 29 depicts the preferred embodiment of the game piece director 148 - a removable plastic section that press-snaps into the interior curve of the upper section 134 of the conduit 136. The game piece director 148 as depicted aids in directing the ball or other playing piece 110 to the center of the back of the curve, as shown in Figs 4 and 5 (the alternate embodiment of a game piece director 148b) thereby minimizing bouncing and promoting a game piece path smoothly following the curve of the conduit. The removable aspect of the game piece director 148, and the shape selected permits the nested coupling of unassembled conduits 136 as depicted in Fig 28. Additional ball guide features - game piece guides 149 - are depicted in Figs 24, 25 and 26.

As may be easily seen in Figs 16 29 and 30, the inventive playing table permits 'tool free' construction, featuring coupleable alignment and structural securing elements. Fig 29 depicts an enlarged view of an alignment pin 138 and the receiving slot for said pin 138b is shown in Fig 27. Further enabling tool-free construction are snap connectors 154 depicted also in Fig 15 and 29.

Figure 17 shows a two level version 101 and Figure 19 shows a more than three level version 103. It is possible, owing to the modularity of the conduit construction, to

increase or otherwise adjust the number of levels to any desired playing environment.

Moreover, the scalability - reducing to miniature sizes, for example, is inherent in the design.

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Such various sizes can include all or any combinations of features taught herein.

Although movement may be imparted to game playing pieces using hands or any device, Fig 18 depicts a stick as may be used in pool. Said stick may be increased in size yet remain portable by a two coupleable sections. The preferred embodiment

10 includes a stick of 36 inches in length assembled from two sections. The preferred embodiment includes a pool cue as the stick, and pool balls as the playing pieces. A playing piece in a spherical shape may range in size from as large as a full size billiard ball (2.25 inch diameter) to as small as a ball bearing (on the order of .375 inch diameter) with a preferred size in the preferred embodiment of about 1.5 inch
15 diameter. The playing piece material may be resin, rubber, plastic, glass, foam or even wood or metal if desired. The playing piece may be in a disc like shape, such as may be used in table hockey, or any other selected shape as the desire game play may suggest.

20 The playing surface itself may be changeably modified. The playing surface itself may be inverted 102 (see Fig 23), making the top the bottom, and making the bottom the playing surface. In the preferred embodiment, the bottom surface includes a honey comb design, that affords structural integrity to the playing surface in addition to providing a surface upon which game playing pieces may be placed. In another
25 embodiment, the playing surface may be modified by means an insert-able sheet of a low friction material fitting flush with and covering some or all of the playing surface. Such insert-able sheet changes the surface characteristics, permitting games such as hockey, as well as the use of game playing pieces having shapes other than substantially spherical. Moreover, the game table is scaleable in size from mini-travel
30 size to larger sizes not intended to be portable. Further, the game table may be modular in construction, allowing users to add or eliminate layers as desired.